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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/594,187	09/25/2006	James Van Alstine	PU0418	7600

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EXAMINER	
CHEU, CHANGHWA J	

ART UNIT	PAPER NUMBER
1641	

NOTIFICATION DATE	DELIVERY MODE
12/16/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

melissa.leck@ge.com

Office Action Summary	Application No.	Applicant(s)	
	10/594,187	VAN ALSTINE ET AL.	
	Examiner	Art Unit	
	JACOB CHEU	1641	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 October 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18 and 29-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _____ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Claims

1. Applicant's amendment filed on 10/2/2009 has been received and entered into record and considered.
The following information provided in the amendment affects the instant application:

Claims 18-28 have been cancelled.
Claims 29-32 have been added to the instant application.
Claims 1-17 and 29-32 are pending and under examination.

2. The rejections on claims 1-3, 5-17 under 35 U.S.C. 102(b) as being anticipated by Shadle et al. (US 5429746) in view of Feng et al. (Biotech Technique 1998 Vol. 12, page 289-293) are withdrawn because Feng et al. teachings in combination with Shadle et al. would not produce an at least 1.5 times increased dynamic binding capacity. Accordingly, the rejection on dependent claim 4 is withdrawn. However, in view of the newly amended claim, a **new ground of rejection** is set forth below in this Office Action.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1-17, 29-30 and 32 rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a particular concentration of non-ionic polymer, such as 6-10% in ion exchange step or 4-8% in affinity step, does not reasonably provide enablement for any concentration of the non-ionic polymer in order to achieve the at least 1.5 times dynamic

binding capacity. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims.

> The present invention relates to a method of isolating a target compound from other components of a liquid, which method comprises at least two chromatographic steps, in any sequence of order, wherein the mobile phase is contacted with an affinity chromatography matrix and/or an ion-exchange chromatography matrix and/or a hydrophobic interaction chromatography matrix, wherein the contacting with at least one of the matrices takes place in the presence of at least one non-ionic polyether; and obtaining the target compound(s) in a separate fraction from the last chromatographic step. In the most preferred embodiment, the non-ionic polyether is poly(ethylene glycol) (PEG).

In view of the arguments, particularly in rebuttal of the use of Feng et al. reference, Applicant specifically **admited** that Feng et al. in fact merely teach using a low concentration of 1% 200PEG for optimal results of recovery, whereas the instant invention:

"Figure 5 in the application shows that to get a significant DBC increase in ion exchange, the concentration of PEG 10000 should be above 2%. Figure 8 shows that over 4% PEG 10000 **is needed** to get this significant DBC (dynamic binding capacity) increase on protein A media" (see Remarks, page 8, second paragraph). Given that the at least 1.5 times better yield is the limitation in the instant amended claim, without a particular workable range, i.e. 4-10% from claim 31, one artisan in the field would not achieve such efficiency.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-3, 5-17, 29-32 are rejected under 35 U.S.C. 102(b) as being anticipated by Shadle et al. (US 5429746) in view of Gagnon et al. (1995 15th International Symposium on HPLC of proteins, peptides, and nucleiotides, page 1-4).

Sahdle et al. teach a method of isolating target molecule, e.g. antibody. The method comprises using multiple steps of column chromatography (See Figure 1). Sahdle et al. teach isolating the target molecules by contacting samples with an affinity chromatography matrix and then ion-exchange followed by hydrophobic interaction chromatography matrix to isolate (elute) the target molecule in a separate fraction from the samples in the presence of ethylene or propylene glycol (See Figure 1 and Col. 2, line 57-60; Col. 7, line 55-62). However, Sahdle et al. do not disclose using non-ionic polyethylene glycol for isolation and purification of the target proteins.

Gagnon et al. teach that polyethylene glycol, a non-ionic polyether 6000 PEG, is suitable for isolation and purification of target proteins. Gagnon et al. observe that using polyethylene glycol, e.g. 10% would provide advantages of improve purification and

recovery of protein isolation (See Figure 1 and 6; Conclusion). The recovery is more than 1.5 times (see Figure 1).

Therefore, it would have been prima facie obvious to one ordinary skill in the art at the time the invention was made to have motivated Shadle et al. to use non-ionic polyethylene glycol, such as taught by Gagnon et al., to isolate target proteins from samples. One ordinary skill in the art would have been motivated to do so in order to increase purity, recovery of the target proteins.

With respect to claims 12-13, Shadle teach using protein A as a ligand on the matrix of the column for isolation (Col. 3, line 30-60).

With respect to claims 14-17, Shadle et al. teach using cross-linked polysaccharide particles, such as dextran as a matrix support in the ion-exchange column (Col. 1, line 30-40; claims 10 and 28).

4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shadle in view of Gagnon et al. and further in view of Bander et al. (US 20040120958).

Shaldle and Gagnon et al. references have been discussed but no explicit teachings on using consecutive ion-exchange chromatography is disclosed.

Bander et al. teach using consecutive ion-exchange chromatography for isolation of antibodies (See Section 0374). It is well-known that performing several consecutive chromatography steps would enhance and improve the purity of antibodies.

Therefore, it would have been prima facie obvious to one ordinary skill in the art at the time the invention was made to have motivated Shadle and Gagnon et al. with consecutive ion-exchange chromatography as taught by Bander et al. to isolate antibodies for optimization and increasing purification, and such modification merely requires routine skill in the art.

Conclusion

5. No claim is allowed.

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JACOB CHEU whose telephone number is (571)272-0814. The examiner can normally be reached on 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Shibuya can be reached on 571-272-0806. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jacob Cheu/
Primary Examiner, Art Unit 1641